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RUNNING HEAD: DISORGANIZED ATTACHMENT AT AGE THREE

Risks and Outcomes Associated with Disorganized/Controlling Patterns of Attachment at Age  
Three in the NICHD Study of Early Child Care and Youth Development

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## Abstract

Disorganized/controlling attachment in preschool has been found to be associated with maternal and child maladjustment, making it of keen interest in the study of psychopathology. Additional work is needed, however, to better understand disorganized/controlling attachment occurring as early as age three. The primary aims of this study were to evaluate risk factors and outcomes associated with disorganized/controlling behavior at age three and to evaluate the risk factors and outcomes differentiating *the four subtypes* of disorganized/controlling attachment. Analyses were conducted with the first two phases of the NICHD Study of Early Child Care and Youth Development, a prospective study of 1,364 children from birth. At 36 months of age, across the attachment-relevant domains of maternal well-being, mother-child interactions, and child social adaptation, the disorganized/controlling group evidenced the most maladaptive patterns in comparison to both secure and insecure-organized groups. At 54 months of age, the disorganized/controlling group displayed the highest levels of internalizing and externalizing behavior problems, as rated by mothers and teachers, and the lowest quality relationships with teachers. Significant differences found among the disorganized/controlling *subtypes* indicated that the behaviorally disorganized and controlling-punitive subtypes had more maladaptive patterns across variables than did the controlling-caregiving and controlling-mixed subtypes.

Key words: preschool attachment, maternal depression, mother-child interaction, behavior problems, disorganized attachment

Risks and Outcomes Associated with Disorganized/Controlling Patterns of Attachment at Age Three in the NICHD Study of Early Child Care and Youth Development.

Attachment theory provides an important paradigm for modeling the mechanisms through which parenting may influence children's social adaptation (Ainsworth, Blehar, Waters, and Wall, 1978). Of particular interest in the study of psychopathology, attachment research has linked disorganized/controlling attachment with low levels of maternal well-being and dysfunctional mother-child interactions, as well as children's maladjustment later in childhood (Lyons-Ruth & Jacobvitz, 2008; van IJzendoorn et al., 1999). Approximately 15% of children in normative samples evidence a disorganized/controlling attachment, while up to 85% of children in maltreated samples do so (van IJzendoorn et al., 1999).

Additional research on disorganized/controlling attachment is needed, however, since the majority of previous studies have focused on infancy (for review, see Lyons-Ruth & Jacobvitz, 2008). The studies that have investigated disorganized/controlling attachment at later developmental periods have mostly examined late preschool and early school-age periods. However, the early preschool period, from ages 2 to 4, is a key time of transition in the forms of disorganization displayed by children. During these years, clear subtypes emerge *within* the disorganized/controlling group, including controlling-caregiving, controlling-punitive, controlling-mixed and behaviorally disorganized profiles. The latter two categories were originally referred to as controlling-general and insecure-other, respectively, but these labels have been changed recently by the training group for the Cassidy-Marvin System (Cassidy, Marvin, & the MacArthur Working Group, 1992). These subtype differences raise questions about whether disorganized/controlling children represent a single group or four distinct subgroups. Studies to identify children and mothers most at-risk for maladjustment in early childhood are vital for

clinical work.

The overall purpose of our study was to examine correlates of disorganized/controlling attachment at 36 months using data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD), a prospective study of 1,364 children from birth through first grade. There were two main aims: to evaluate risk factors and outcomes associated with disorganized/controlling attachment at 36 months of age and to assess risk factors and outcomes *differentiating* the four subtypes of disorganized/controlling attachment.

#### *Stability of Disorganized/Controlling Attachment Behavior during the Preschool Years*

Between the middle of the second year and the end of the third year, children evidence shifts in social-cognitive sophistication and linguistic competence. In relation to attachment behaviors, these changes increase children's abilities to communicate their own perspectives, to take their caregivers' perspectives, and actively participate in negotiations to achieve common goals (Cassidy et al., 1992; Main & Cassidy, 1988). Consequently, attachment-related interactions between mothers and children differ between infancy and preschool, with disorganized children and their mothers exhibiting the greatest changes (Main & Cassidy, 1988; Wartner et al., 1994).

The preschool and school-age attachment behaviors of secure, avoidant and ambivalent children differ from infancy primarily in the increased verbal negotiation and planning between parent and child (Cassidy et al., 1992; Main & Cassidy, 1988), but their relative functions (e.g., minimization of distress expression for avoidant children and exaggeration of distress expression for ambivalent children) are consistent with behaviors in infancy. In contrast, attachment behaviors associated with *disorganization* differ dramatically from those of infancy. Between

two and six years of age, a developmental shift occurs for many disorganized infants from disorganized behavior to controlling patterns of behavior toward the parent. In studies of six-year-olds, children classified as disorganized in infancy most often exhibit controlling behavior toward the parent on reunion (Main & Cassidy, 1988; Wartner et al., 1994). Controlling children “actively attempt to control or direct the parent’s attention and behavior, and assume a role which is usually considered more appropriate for a parent with reference to a child” (Main & Cassidy, 1988, p. 418). Controlling-punitive children direct caregivers’ activities with hostility or by demeaning them, while controlling-caregiving children guide caregivers by being overly cheerful and attentive (Main & Cassidy, 1988). Other children mix punitive and caregiving behaviors in their parental interactions, or control the parent without showing caregiving or punitive features.

However, 25 to 33% of disorganized infants do not develop a controlling attachment pattern by school age (Cicchetti & Barnett, 1991). These behaviourally disorganized children continue to exhibit anomalous, out-of-context behaviors in relation to the parent, similar to the disorganized behaviors of infancy (Main & Cassidy, 1988; Moss et al., 2005; Wartner et al., 1994). Therefore, the current system for coding attachment behavior among children ages three through six includes four subtypes of disorganized/controlling attachment: controlling-caregiving, controlling-punitive, controlling-mixed and behaviorally disorganized (Cassidy et al., 1992).

While much literature shows moderately high stability from infancy to middle childhood in terms of secure and insecure-organized attachment, research on stability of disorganized/controlling attachment is mixed. A meta-analysis by van IJzendoorn et al. (1999) showed good stability of disorganized/controlling behavior from infancy to school age among

predominantly low-risk samples (between 82 and 87% stability,  $r = .40$  ( $n = 223$ ;  $p < .001$ )). A subsequent study by Moss et al. (2005) found that 77% of disorganized/controlling children at age 3 ( $n = 13$ ) also were classified as disorganized/controlling at age 6 ( $n = 10$ ; overall  $n = 120$ ). However, the subtype of disorganized/controlling behavior in the Moss et al. (2005) sample changed substantially over this period, with 66% of children at age 3 classified as behaviorally disorganized, while by age 6, 66% were classified as controlling (Moss et al., 2005). This suggests that substantial developmental change from behavioral disorganization to controlling behavior occurs between ages 3 and 6.

In contrast to the stability demonstrated from infancy to the school years, results from the NICHD SECCYD study to assess stability in disorganization from infancy to age three found a stability rate of only 20% (NICHD ECCRN, 2001). As other stability studies have assessed controlling behavior at age six – when controlling behavior is better consolidated – this lower rate from the NICHD SECCYD may reflect instability in behavioral presentations from infancy to age three, when controlling patterns are beginning to emerge.

*Comparisons among Secure, Insecure, and Disorganized/Controlling Children in Correlates of Attachment Behavior*

Previous research with preschool children ages four to six indicates that the disorganized/controlling group differs from secure, and to a lesser extent, insecure-organized (e.g. avoidant and ambivalent) children in the attachment-relevant domains of maternal well-being, quality of mother-child interactions and child social adaptation. Mothers of disorganized/controlling children report more dysfunctional relationships with partners and more depression than mothers of secure and insecure-organized children (Mills-Koonce et al., 2008; Moss, Bureau, Cyr, Mongeau, & St-Laurent, 2004a; Stevenson-Hinde & Shouldice, 1995). In

relation to mother-child interactions, numerous studies indicate that at preschool and school ages, disorganized/controlling dyads evidence lower quality parent-child communication, affective attunement, reciprocity and emotion-regulation than secure and insecure-organized dyads (for review, see Lyons-Ruth & Jacobvitz, 2008). In regards to child social adaptation at preschool and school age, disorganized/controlling children show the highest levels of disruptive behaviors and internalizing symptoms compared to secure and insecure-organized children (Greenberg, Speltz, DeKlyen, & Endriga, 1991; Moss, Cyr, & Dubois-Comtois, 2004b; Munson, McMahon, & Spieker, 2001; NICHD ECCRN 2001; Solomon, George, & DeJong, 1995). Furthermore, disorganized/controlling children have somewhat poorer interactions with friends and worse relationships with teachers (McElwain, Cox, Burchinal, & Macfie, 2003; O'Connor & McCartney, 2006).

In the only study to examine these attachment-related constructs among three-year-old children, Moss and colleagues (2004a) found that mothers of disorganized/controlling children reported more parenting stress than mothers of secure or insecure-organized children and that disorganized/controlling dyads had poorer quality free play interactions than all other dyads. Additionally, according to preschool teachers, disorganized/controlling children had more externalizing behavior problems than secure and insecure-organized children, as well as more internalizing behavior problems than secure children. However, the modest size of the disorganized/controlling group ( $n = 15$ ) limits statistical power and potential generalizability.

In summary, previous research indicates a linear pattern among secure, insecure-organized and disorganized/controlling attachment groups in regards to maternal well-being, mother-child interactions and child social adaptation. Insecure-organized children and their mothers appear to be in the middle of a continuum, between secure and disorganized/controlling



children and their mothers (e.g. Moss, et al., 2004b). However, little research has examined this trend in the transitional early preschool years.

*Comparisons among Subtypes of Disorganized/Controlling Attachment*

A small body of empirical work also indicates differences *within* the disorganized/controlling group. Some researchers have suggested that controlling patterns, in general, may be more optimal than the behaviorally disorganized pattern, as each of the controlling patterns serves the child strategically in attempting to elicit the caregiver's attention and involvement in times of need (Moss, Bureau, St-Laurent, & Tarabulsky, in press; Teti, 1999). Some evidence supports this argument. For example, Moss et al. (2004b) found that mothers of behaviorally disorganized 6-year-olds reported less marital satisfaction than mothers of controlling children, and controlling children scored higher on dyadic coordination and communication with their mothers than behaviorally disorganized children. Also, O'Connor & McCartney (2006) found that behaviorally disorganized, but not controlling, children had significantly worse relationships with child care and elementary school teachers than their secure peers. Furthermore, the behaviorally disorganized pattern is more prevalent than controlling patterns among high-risk samples, including maltreated preschool (Cicchetti & Barnett, 1991) and orphanage-reared, adopted children (O'Connor, Marvin, Rutter, Olrick, Britner, & the ERA study team, 2003), indicating that it may be difficult for children in disturbed environments to consolidate controlling patterns of attachment.

A few studies indicate differences *among the controlling subtypes*. In one study of school-aged children, researchers found more parenting stress among mothers of controlling-punitive than controlling-caregiving children (Moss et al., 2004b). Additionally, in Teti's (1999) sample of four-year-olds, controlling-punitive children showed less interactive competence with

their mothers than secure children. Only one study has compared externalizing and internalizing behavior problems *among the controlling subtypes*. Moss et al. (2004b), in their study of six-year-olds, found that teachers reported higher levels of externalizing behaviors among controlling-punitive than secure children, and higher levels of internalizing behaviors among controlling-caregiving than secure children. Unexpectedly, teachers did not report maladaptive internalizing or externalizing symptoms for behaviorally disorganized children. Given these behavioral differences among the disorganized/controlling subtypes, it is unclear whether disorganized/controlling dyads should be considered at similar risk across subtypes or if substantial differences among subtypes modify this conclusion (Teti, 1999). Furthermore, the small numbers of disorganized/controlling children in previous studies limit the power of comparisons among the groups. Moss et al.'s (2004b) study was the largest, but the numbers of controlling-punitive, controlling-caregiving and behaviorally disorganized children were still small and controlling-mixed children were forced-classified as either punitive or caregiving. Additionally, children in the Moss et al. (2004b) study were school-aged, limiting the study's value for the early preschool period.

#### *Previous Attachment-Related Findings from the NICHD SECCYD Study*

Previous studies conducted with the NICHD SECCYD sample have provided valuable information about disorganized/controlling attachment at 15 and 36 months in relation to maternal risk factors and child outcomes through first grade. We summarize those findings below.

*Infant Attachment at 15 Months.* Overall, analyses of 15-month attachment data found no differences in maternal psychological adjustment by attachment pattern (depression and three NEO personality scales) (NICHD ECCRN, 1997). However, several reports documented that

avoidant infants had the least sensitive mothers (NICHD ECCRN, 1997; McElwain et al., 2003; NICHD ECCRN, 2006), concurrently and over time to 54 months. The disorganized group fell between the avoidant and secure groups. Several analyses found no relation between attachment security or disorganization at 15 months and child behavior problems reported by mothers or child care providers at 36 months (McCartney et al., 2004; Belsky & Fearon, 2002). Belsky and Fearon (2002) did find that contextual risk (a composite of low income, maternal depression, etc.) predicted declines in social competence among insecure children from 15 to 36 months, but not among secure or disorganized children. Lastly, one set of analyses found that avoidant infants were rated at 54 months and first grade by their *mothers* as less socially competent than secure infants and by their *teachers* as more externalizing than secure or ambivalent infants. Teachers rated both avoidant and disorganized infants as more internalizing (NICHD ECCRN, 2006).

*Infant Attachment at 36 Months.* In the first report on the NICHD SECCYD *preschool* attachment data (NICHD ECCRN, 2001), across six maternal variables and four child variables, the disorganized/controlling group showed differences on nine variables from the secure group, while the avoidant group differed on two variables and the ambivalent group on six. However, the report did not identify the variables for which the disorganized/controlling group differed from the secure and insecure groups. Most variables were composites, and no statistics or analyses were given.

In later reports, significant differences in maternal well-being were associated with attachment classification, with mothers of disorganized/controlling children significantly more likely to have chronic depressive symptoms (Mills-Koonce et al., 2008). In addition, mothers of disorganized/controlling rather than avoidant children were rated as least sensitive when their

children were six to 36 months of age (NICHD ECCRN, 1997; but see McElwain et al., 2003). Child behavior problems at 36 months were somewhat more strongly related to 36-month attachment than 15-month attachment, with secure children exhibiting fewer behavior problems (NICHD ECCRN, 2001) and less instrumental aggression with friends than their insecure-organized and disorganized/controlling peers (McElwain et al., 2003). McCartney et al. (2004) also found that, after controlling for security of attachment at 15 and 24 months, change to attachment insecurity at 36 months added to the prediction of internalizing problems at 36 months but not to the prediction of externalizing problems. Disorganization at 36 months, with 15-month disorganization controlled, did not contribute to either externalizing or internalizing problems, as assessed at 36 months.

In sum, despite a patchwork of findings in different domains, 36-month disorganized/controlling attachment in the NICHD SECCYD has not yet been investigated systematically in relation to the broad array of variables theoretically related to attachment status, including maternal well-being, mother-child interaction and child social adaptation. In addition, no prior report on the NICHD SECCYD has examined differences among the four disorganized/controlling subtypes, despite indications that controlling and behaviorally disorganized patterns, as well as caregiving and punitive patterns, present different contextual correlates and social-adaptational outcomes.

The present study examined differences in 18 variables indexing the attachment-relevant domains of maternal well-being, mother-child interaction and child social adaptation among secure, insecure-organized and disorganized/controlling dyads, as well as among dyads with each subtype of disorganized/controlling attachment. The NICHD SECCYD sample was well-suited for this study because it is similar to other studies of preschool attachment in being

socioeconomically diverse and relatively low-risk (e.g. Main & Cassidy, 1988; Moss et al., 2004b; Solomon et al., 1995; Stevenson-Hinde & Shouldice, 1995; Wartner et al., 1994). Our assessments were designed to be as comparable as possible to those in Moss et al. (2004a)'s study, the largest previous study of preschool attachment.

## Method

### *Participants*

This study used data from the first two phases of the NICHD SECCYD. The original sample consisted of 1,364 mothers and children recruited in 1991 from 31 hospitals from 10 locations in the United States,(see NICHD ECCRN,1997 for additional information). The sample is 24% ethnic minority; 11% of the mothers did not have a high school education and 14% were single when their children were born (NICHD ECCRN, 1997). The current sample included 1,140 children and their mothers who completed the assessment of child attachment at 36 months. They were compared with those from the original sample who dropped out of the study or didn't finish the attachment assessment. In the sample with 36-month attachment data, mothers were more likely to have completed high school ( $\chi^2 = 12.21, p < .001$ ), and children were more likely to be white ( $\chi^2 = 15.58, p < .001$ ).

### *Measures*

*Family income.* At 6, 15, 24, and 36 months, the ratio of family income-to-needs was computed by dividing total family income by the poverty threshold for the appropriate family size (U.S. Bureau of the Census, 1999). An average income-to-needs ratio from 6 to 36 months was created.

*Gender.* Gender was dummy coded with male = 0 and female = 1.

*Child attachment.* A modified Strange Situation procedure, based on recommendations by Cassidy et al., (1992), was used to assess attachment patterns at 36 months. The mother and child were invited to make themselves comfortable in a room, and after three minutes, the mother left. The first separation lasted three minutes, unless the child was distressed. After a three-minute reunion, the mother left again for five minutes, as more time away from the mother may be needed to induce anxiety in older children. The children's behaviors during the assessment were classified according to the MacArthur Working Group on Attachment coding system (Cassidy et al., 1992) that assesses preschoolers as secure, ambivalent, avoidant, controlling-caregiving, controlling-punitive, controlling-mixed or behaviorally disorganized. Secure children resume calm, comfortable interactions with their mothers upon reunion. Insecure-avoidant children maintain polite neutrality toward their mothers and limit emotional expressions towards them, even after reunion. Insecure-ambivalent children are fussy, helpless, whiny and/or resistant toward their mothers. Controlling children take charge of the reunion. Controlling-caregiving children are overly solicitous, while controlling-punitive children are harshly directive or rudely humiliating. Controlling-mixed children either vacillate between caregiving and punitive behaviors or show excessive controlling behaviors that are neither clearly caregiving nor punitive. Behaviorally disorganized children do not demonstrate a coherent attachment strategy during reunion and/or display disorganization according to infancy criteria. Intercoder agreement (before conferencing) on the categorical classifications was 75.7 percent ( $\kappa = .58$ ) (McCartney et al., 2004).

*Maternal romantic relationship quality.* Mothers completed the *Love and Relationships Questionnaire* (NICHD ECCRN, 1999) that measures the quality and characteristics of relationships with husbands or partners. Each of the six questions is answered on a 5-point Likert

scale, with responses ranging from 1 = “strongly disagree” to 5 = “strongly agree.” The total score represents the average of all responses, with higher scores indicating better mother-partner relationships. Items demonstrate high internal validity ( $\alpha = .86$ ).

*Maternal depression* was assessed at 36 months with the well-normed, 20-item *Center for Epidemiological Studies Depression Scale* (CES-D; Radloff, 1977). A score of 16 or greater is considered indicative of clinically significant depression. The reliability and validity of the CES-D are well-established, with 100% sensitivity and 88% specificity in relation to clinical diagnosis (Radloff, 1977).

*Maternal parenting stress* was assessed at 36 months using a 21-item subscale of the *Abidin Parenting Stress Index* (Abidin, 1983) which asks respondents about their feelings of competence as a parent. Items are rated on a 4-point Likert scale ranging from 1 = “not at all a concern” to 4 = “extreme concern.” Internal reliability is high ( $\alpha = .79$ ). The validity of the *Parenting Stress Index* is well documented (Abidin, 1983).

*Mother-child interaction.* The quality of mother-child interaction was evaluated at 36 months for maternal hostility, maternal respect for child autonomy, maternal support, mother-child cooperation and child affection during a 15-minute structured interaction task in which mothers were asked to have their children play with age-appropriate toys in a set order. Maternal hostility was assessed using a 7-point rating based on the amount of hostile behavior directed at the child during the task. Maternal respect for child autonomy was evaluated, again with a 7-point scale, based on how much the mother facilitated her child’s exploration. Maternal support also was assessed using a 7-point scale, based on the quality of instructional and emotional support the mother provided her child during the structured interactions. Mother-child cooperation was rated with a 5-point scale during lab clean-up after the interaction task, with

higher scores indicating more verbal and non-verbal agreement and compliance. Child affection was assessed on the same task, using a 7-point scale, with higher scores indicating higher levels of child affection towards the mother. Inter-coder reliability, on 19–20% of randomly chosen tapes, was .81, .89, .88, .87, and .82 respectively.

*Child compliance and disruptive behavior* was reported by mothers on the *Adaptive Social Behavior Inventory* (ASBI; Hogan, Scott, & Bauer, 1992) at 36 months. The ASBI, a 30-item scale designed to assess pro-social behaviors, asks respondents to indicate the response that best describes the child: “1 = rarely or never”, “2 = sometimes”, or “3 = almost always”. Two subscales from the ASBI were used in the current study: the 10-item Comply scale ( $\alpha = .82$ ) and the 7-item Disrupt scale ( $\alpha = .60$ ).

*Maternal report of child internalizing and externalizing behavior problems* was obtained at 36 and 54 months, using the parent version of the *Child Behavior Checklist* (CBCL; Achenbach, 1991a). The CBCL contains 120 items reflecting a broad range of child behavioral/emotional problems. Scores above 50 indicate that the raw score was above the normal mean for the CBCL. The checklist has good test-retest reliability and concurrent and predictive validity; it discriminates between clinically referred and non-referred children, and it predicts problem scores over a three-year period (Achenbach, Edelbrock, & Howell, 1987).

*Teacher report of child internalizing and externalizing behavior problems* was obtained at 54 months using the *Teacher Report Form* of the Child Behavior Checklist (TRF; Achenbach, 1991b). The TRF contains 120 items that cover a broad range of children’s behavioral/emotional problems. Scores above 50 demonstrate that the raw score was above the mean in the norming population. The TRF has good test-retest reliability and concurrent and predictive validity (Achenbach, Thomas, & Rescorla, 2001).



*Children's positive interactions with peers* were evaluated at 54 months using the *Observational Record of the Caregiving Environment* (ORCE). During the ORCE, the child is observed for 44 minutes, over two cycles, and a trained observer alternately records behavior and qualitative ratings of the environment. The behavior scales record frequency of behaviors such as interaction with others, behavior management, stimulation of development and behavior in a solitary activity, in 30-second segments. The Peer Positive Interaction Composite is computed as the sum of cooperative play, boisterous play, and other positive/neutral interaction. These variables were first standardized with a mean of 0 and a standard deviation of 1, then summed.

*The quality of children's relationships with teachers* at 54 months was assessed with the *Student Teacher Relationship Scale* (Pianta, 1992), a 35-item scale designed to capture teacher perceptions of their relationship with the child ( $\alpha = .84$ ). Teachers rate the quality of the relationship on 5-point Likert scales, such as "(1) = 'definitely not' to (5) = 'definitely like this child'." Higher scores indicate a higher quality relationship. The items on this scale were derived from attachment research and literature on teacher-child interactions.

#### *Analytic plan*

Two major sets of analyses were conducted. The first set, using ANCOVAs, examined differences across the secure, insecure-organized and disorganized/controlling groups. Previous research with the NICHD SECCYD sample found three-year-old girls more likely than three-year-old boys to be classified as disorganized/controlling rather than secure, and more likely to be classified as ambivalent rather than avoidant. In addition, children from families with higher incomes were more likely to be classified secure rather than insecure-organized (see NICHD ECCRN, 2001). Therefore, the current study included gender and family income as covariates in its analyses. Linear trend analyses were first conducted to see if a linear trend existed across the

secure, insecure-organized and disorganized/controlling attachment groups. Follow-up comparisons examined which pair-wise differences were significant. Finally, the 18 variables were ranked across the secure, insecure-organized and disorganized/controlling groups from best to worst and a Friedman rank test was conducted to assess whether the disorganized/controlling dyads' overall pattern of means across variables differed from that of their secure and insecure-organized peers.

The second set of analyses examined differences among *the four subtypes* of disorganized/controlling attachment at 36 months, using overall ANOVAs with follow-up pair-wise comparisons among subtypes. Because gender and family income were unrelated to the four subtypes of disorganized/controlling attachment, they were excluded as covariates.

Lastly, two sets of McNemar exact tests were run to see if behaviorally disorganized dyads demonstrated a pattern of risk over all 18 variables that differed from the controlling dyads as a group, and to look for differences *among* the three controlling subtypes across all 18 variables.

Several subsidiary analyses were also run. First, previous research with preschool-aged children and their mothers indicates that avoidant and ambivalent mother-child dyads do not differ on most of the variables used in the current analyses (see Moss, et al., 2004b). Research in infancy, however, presents more inconsistent results. Given the transitional nature of the three-year-old period, we ran all linear trend analyses and follow-up comparisons in three ways: 1) including avoidant and ambivalent children in the insecure-organized group; 2) including only avoidant children in the insecure-organized group; and 3) including only ambivalent children in the insecure-organized group. All analyses yielded similar results. Therefore, only those with the combined grouping are reported (models available on request).

A final set of analyses evaluated whether considering 15-month disorganized attachment assessments alongside the 36-month assessments would yield a stronger pattern of findings. Such a finding would suggest that stability of disorganized attachment may be driving results related to disorganized/controlling attachment at 36 months. To this end, we conducted additional ANCOVAs examining differences between disorganized and non-disorganized children in three ways: 1) comparing children classified as disorganized and not disorganized at 15 months; 2) comparing children classified as disorganized and not disorganized *at either 15 or 36 months*; and 3) comparing children classified as disorganized and not disorganized at 36 months only.

Given the low stability from 15 to 36 months in disorganized attachment status in the NICHD SECCYD, there was not adequate power to conduct a meaningful analysis of the group which was classified disorganized *at both ages*. Only 33 children were in the stable disorganization group. However, if significant differences were *not found* between children classified as disorganized and not disorganized at 15 months, then it would be possible to conclude that 15-month disorganization, and/or stability of disorganization from 15 to 36 months, was not driving differences between children classified as disorganized/controlling at 36 months and their peers.

Skewness statistics for the variables reported here indicated that analyses which assume normality were appropriate. Missing values for independent variables were imputed using a Markov chain Monte Carlo (MCMC) method (Schafer, 1997), as the data were normally distributed, and appeared to be missing at random. The MCMC method uses simulation from a Bayesian prediction distribution. Rubin's relative efficiency calculations determined the appropriate number of imputations (Rubin, 1978). Twenty imputations were performed with a burn-in period of 500. SAS PROC MIANALYZE, which aggregates the results of the analyses

performed on the data sets to produce precise parameter estimates, was used to calculate final parameter estimates (Schafer, 1997).

## Results

Table 1 contains descriptive statistics. Approximately seventeen percent of three-year olds were classified as disorganized/controlling, while the majority of participants evidenced a secure attachment. Mean scores for mothers' ratings of children on the CBCL approximated the normed mean of 50.

### *Comparison of risks and outcomes for secure, insecure-organized and disorganized/controlling children*

*Analysis of individual variables.* Table 2 displays means, standard deviations, F values, linear trend statistics, and *post hoc* comparisons for the 18 variables in the three domains of maternal well-being, mother-child interaction and child social adaptation. On the three maternal well-being variables, a significant linear trend was found only for maternal depression, with mothers of disorganized/controlling children reporting the highest levels of depression. Follow-up comparisons indicated that mothers of secure children had significantly lower levels of depression than mothers of disorganized/controlling children. The groups showed no differences on romantic relationship quality or parenting stress.

Table 2 also indicates that for the five mother-child interaction variables, significant linear trends were found for all variables, with mothers and their secure children showing the most optimal scores, and mothers and their disorganized/controlling children displaying the least optimal scores. Follow-up contrasts indicated that mothers of both secure and insecure-organized children showed significantly lower levels of hostility than mothers of disorganized/controlling children. Additionally, mothers of secure and insecure-organized children displayed higher levels

of maternal respect for autonomy and offered higher levels of support than mothers of disorganized/controlling dyads. Lastly, in terms of mother-child cooperation, secure dyads showed higher levels of cooperation than disorganized/controlling dyads.

Significant linear trends also occurred for nine of the ten child social adaptation variables, including compliance, mother-reported internalizing and externalizing behavior at 36 and 54 months, teacher-reported internalizing and externalizing behavior at 54 months, quality of peer interactions, and quality of the teacher-child relationship at 54 months. Secure children evidenced the most optimal scores, while disorganized/controlling children displayed the least optimal scores for all measures except quality of peer interaction. The linear trend was non-significant only for child disruptive behavior reported by mothers.

In follow-up contrasts, secure children demonstrated higher levels of compliance than disorganized/controlling children, and lower levels of internalizing behaviors at 36 and 54 months, as rated by both mothers and teachers, than disorganized/controlling children. Additionally, secure children demonstrated lower levels of externalizing behaviors, as rated by mothers at 36 months and as rated by teachers at 54 months, than both insecure-organized and disorganized/controlling children. On maternal reports of externalizing behaviors at 54 months, secure children demonstrated lower levels of externalizing behaviors than disorganized/controlling children but did not differ from insecure-organized children. Lastly, secure children demonstrated more positive peer interactions and higher quality teacher-child relationships than insecure-organized or disorganized/controlling children.

*Analysis of the pattern of effects across variables.* As previously noted, linear trends occurred on 15 of 18 variables. In addition, *post hoc* contrasts indicated that the disorganized/controlling group differed significantly from the *secure* group on 15 variables and

also from the *insecure-organized* group on four of the five mother-child interaction variables (greater maternal hostility, less maternal respect for autonomy, less maternal support and less parent-child cooperation). However, these individual tests on all variables do not assess group differences in the *overall pattern of results* across variables. The relatively few significant differences between insecure-organized and disorganized/controlling groups leaves unclear whether they should be considered as distinct groups for overall risk. However, if there were no real differences between the insecure-organized and disorganized/controlling groups, it would be expected that these two groups would trade places as the group with the least optimal mean from variable to variable.

To test whether the rank ordering of the means for the three attachment groups *across all assessment domains* differed from what would be expected by chance, means for each group were ranked from best (most adaptive) to worst (least adaptive) on each variable, and a Friedman rank test compared their relative rankings across all variables. The Friedman rank test result was significant,  $\chi^2(2) = 30.33$ ,  $p = .000$ . The disorganized/controlling group ranked lowest on 16 of 18 assessments and second lowest on the remaining two of 18. The insecure-organized group ranked lowest on only two measures, but second lowest on 15 of 18. The secure group never ranked lowest and ranked first on 17 of 18 assessments. In individual comparisons, the disorganized/controlling group differed significantly from both secure and insecure-organized groups on rankings across variables (Secure vs. disorganized/controlling, Friedman's test:  $p < .001$ ; Insecure vs. disorganized/controlling, Friedman's test:  $p < .001$ ). This indicates that although the mean differences tested earlier between insecure-organized and disorganized groups on each variable were often too small to be significant, the cumulative difference across

variables is significant. The results confirm a picture of multifaceted but subtle dysfunction affecting parents and children in the disorganized/controlling group.

A set of follow-up analyses also evaluated whether combining the 15 and 36 months assessments of disorganization would yield a stronger pattern of findings. Analyses indicated that including the 15-month classifications weakened the pattern of results (full results available upon request). When only the 15-month attachment data were used, there were no significant differences on any of the variables in Table 2. However, when the 36-month data were classified as disorganized/controlling or not disorganized/controlling, disorganized/controlling children differed significantly from those not disorganized on 16 of the 18 variables, including 2 of 3 maternal well-being variables, all 5 of the mother-child interaction variables and 9 of 10 behavior problem variables. Furthermore, when the data were classified as disorganized at *either* 15 *or* 36 months, the ever-disorganized group differed from the never-disorganized group on 13 of the 18 variables, compared to 16 of 18 for the 36-month data alone. This pattern of results shows that stability of disorganized attachment does not explain the differences among the secure, insecure/organized and disorganized/controlling groups at 36 months. Instead, it points to the emergence of an increasingly risk-related pattern of behavior by age 3.

*Comparisons of risks and outcomes among the four disorganized/controlling subtypes*

*Analysis of individual variables.* Table 3 displays the means, standard deviations and statistics for the four subtypes of disorganized/controlling behavior on all variables. Table 3 also displays the significance of the F-test among the four subtypes only, as well as the significance of the F-test contrasting all six attachment groups (i.e. secure, insecure, controlling-caregiving, controlling-mixed, controlling-punitive and behaviorally disorganized).

Mothers of behaviorally disorganized children reported significantly lower quality romantic relationships than mothers of caregiving and punitive children. There were no subgroup differences on parenting stress or maternal depression.

In relation to mother-child interaction, mothers of behaviorally disorganized and punitive children displayed less support for the child than mothers of controlling-mixed children. In addition, both behaviorally disorganized children and punitive children showed less affection for their mothers than caregiving or controlling-mixed children.

Subtype differences were also found in child social adaptation. Punitive children showed the highest levels of disruptive behavior as reported by their mothers at 36 months, differing significantly from both caregiving and behaviorally disorganized children. Controlling-mixed children were also significantly more disruptive than caregiving children but did not differ from the behaviorally disorganized children. Strikingly, including both the secure (10.54) and insecure-organized (10.56) groups, the controlling-caregiving (10.19) subgroup had the *lowest* mean score on disruptive behavior of any group in the study, while the controlling-punitive (11.46) subgroup had the highest. This striking and significant variation *among* the controlling subtypes on disruptive behavior argues against combining these subtypes in future analyses of this class of behavior. By 54 months, significant differences were also seen among subtypes in peer interactions and teacher-child relationships. Behaviorally disorganized, caregiving, and punitive children had much lower scores on positive peer interactions than controlling-mixed children, and behaviorally disorganized children had worse relationships with teachers than caregiving children (see Table 3).

These subtype differences indicate that the *behaviorally disorganized subtype* differed more dramatically from the *insecure-organized* group than did the disorganized/controlling



group *as a whole*. As shown in Table 3, the behaviorally disorganized subtype differed significantly from the insecure-organized group on maternal depression, maternal romantic relationships, teacher-rated externalizing behavior at 54 months, and teacher-child relationship quality at 54 months. Also, the behaviorally disorganized subtype differed significantly from the secure group on all measures *except* parenting stress, child disruptive behavior, and mother-rated externalizing behavior at 54 months.

Interestingly, the controlling-punitive subtype also differed significantly from the insecure-organized group on maternal hostility, maternal respect for autonomy, child compliance, and child disruptive behavior. The controlling-punitive group differed from the secure group on all five mother-child interaction variables, and also on child compliance, child disruptive behavior, mother-reported internalizing and externalizing problems at 36 months, and on teacher-reported externalizing problems at 54 months (see Table 3). In sum, both behaviorally disorganized and controlling-punitive children exhibited poor quality relationships with mother at 36 months and behavior problems in the classroom by 54 months, unlike controlling-caregiving or controlling-mixed children.

*Analysis of the pattern of effects across variables.* There were also significant differences among the four disorganized/controlling subtypes in the patterning of results across all 18 variables, Friedman ranks test,  $\chi^2(3) = 24.87$ ,  $p < .001$ . One or another of the controlling subtypes ranked best on all 18 variables (caregiving = 9; mixed = 6; punitive = 3), and one or another of the controlling subtypes ranked second best on 16 of the 18 variables (caregiving = 9; mixed = 5; punitive = 2). The behaviorally disorganized subtype ranked lowest on 9 of 18 variables, compared to 8 for punitive, 1 for mixed, and none for caregiving. The behaviorally disorganized group differed significantly from the caregiving group in their ranking distribution

(Friedman's test  $p < .001$ ), and from the mixed group (Friedman's test  $p < .01$ ), but did not differ significantly from the punitive group (Friedman's test  $p = .64$ ). Thus, the behaviorally disorganized subtype was the most maladaptive subtype overall at age three.

Significant differences also emerged among the controlling subtypes, with the punitive subtype evidencing the most maladaptive pattern across all 18 variables. Results from Friedman's tests indicated that over all variables, the punitive subtype significantly differed from the caregiving subtype (Friedman's test;  $p < .01$ ) and marginally differed from the mixed subtype (Friedman's test;  $p = .06$ ). The caregiving and mixed subtypes did not differ from one another (Friedman's test;  $p = .16$ ).

### Discussion

The objective of this study was to examine maternal and child behaviors related to disorganized/controlling patterns of attachment as early as age three. First, disorganized/controlling behavior at 36 months was more strongly associated with family risks and was a better predictor of 54 months' outcomes than was disorganization assessed in infancy at 15 months. This is an important finding because the NICHD SECCYD is the only larger longitudinal data set with attachment data at both 15 and 36 months, and no other study has assessed such a wide range of risks and outcomes. Specifically, by age three, on 14 of 18 variables related to maternal well-being, mother-child interactions and child social adaptation, a linear trend was evident in which secure dyads displayed the most adaptive patterns and disorganized/controlling dyads the least. In addition, pair-wise tests demonstrated that disorganized/controlling dyads differed significantly from secure dyads on 15 variables and from insecure-organized dyads on four variables. In particular, mothers of disorganized/controlling children experienced more depression and displayed the poorest interactions with their children

as measured by maternal hostility, maternal respect for autonomy, maternal support, mother-child cooperation and child affection. Furthermore, disorganized/controlling children showed the lowest levels of compliance and the highest levels of internalizing and externalizing behavior problems at both 36 and 54 months. In addition, rank ordering of means across the 18 variables indicated that the disorganized/controlling group had the least adaptive scores on 16 of 18 variables, while the insecure/organized group had the least adaptive scores on only two variables. These findings indicate that disorganized/controlling attachment patterns are associated with greater risk than insecurity in general.

A second set of analyses demonstrated additional important differences among the four *subtypes* of disorganized/controlling attachment. Notably, the behaviorally disorganized subtype was associated with a more maladaptive overall pattern of risks and outcomes than the caregiving and mixed subtypes. The behaviorally disorganized subtype was at the worst end of the continuum on 11 of the 18 variables and second worst on another five, in contrast to the caregiving and mixed subtypes. The punitive subtype also differed from the caregiving and mixed subtypes in the overall patterns of means, scoring the worst on six of the variables and second worst on seven. Caregiving children had the strongest overall profile of means among the subtypes, ranking best on nine variables and second best on the other nine. There were no significant differences on variables between the caregiving and secure children.

Analyses of individual variables demonstrated that mothers of behaviorally disorganized children had significantly higher depression scores than mothers of secure and insecure-organized children. Mothers of behaviorally disorganized children also had significantly worse romantic relationships than secure, insecure-organized, controlling-caregiving and controlling-punitive children. Additionally, mothers of behaviorally disorganized children were more hostile

and less respectful of their children than mothers of secure and insecure-organized children, and gave them lower levels of support than mothers of secure, insecure-organized and controlling-mixed children. Behaviorally disorganized children were themselves less cooperative than secure and insecure-organized children, and showed lower levels of affection towards their mothers than secure, insecure-organized, controlling-caregiving and controlling-mixed children. Lastly, behaviorally disorganized children evidenced higher levels of internalizing and externalizing behaviors than their secure and insecure-organized peers, had lower quality peer interactions than their secure and controlling-mixed peers, and experienced poorer relationships with teachers than their secure, insecure-organized and controlling-caregiving peers.

These findings on higher levels of depression and lower-quality romantic relationships among mothers of behaviorally disorganized children extend previous work from small-scale studies to a large and relatively diverse national sample. Empirically, depressed mothers have been shown to be both hostile and withdrawing in interactions with their children (Lyons-Ruth, Lyubchik, Wolfe, & Bronfman, 2002). Such contradictory behavior by the caregiver may interfere with the child's organization of a consistent controlling attachment strategy into his or her preschool years (Lyons-Ruth, Bronfman, & Parsons, 1999). However, children may also influence parents' levels of depression over time and those children who *are* able to organize a controlling-caregiving strategy may help regulate parental emotional states. For example, Moss and her colleagues linked an increase in children's controlling-caregiving behaviors in preschool to a reduction in maternal self-reported depressive symptoms (Moss et al., in press).

In relation to romantic relationships, Moss et al. (in press) have speculated that marital conflict in families of behaviorally disorganized children may be particularly acute and contribute to an unpredictable, chaotic family environment that compromises the children's abilities to develop

an organized strategy of attachment, even a controlling one. Additionally, fathers have been shown to be more negative and intrusive with their children in families with high levels of marital tension (e.g. Belsky, Youngblade, Rovine, & Volling, 1991), and this may further undermine a child's development of a controlling pattern of attachment. More research on mother-child and father-child interaction among disorganized/controlling groups in the context of marital conflict is needed.

Controlling-mixed children exhibited levels of adaptation between those of the controlling-caregiving and controlling-punitive subtypes. While controlling-mixed children were less compliant and more disruptive than their controlling-caregiving peers, they showed more affection toward their mothers, and their mothers were more supportive toward them than mothers of children with controlling-punitive and behaviorally disorganized interactions. This pattern of results is consistent with a "mixed" attachment classification, indicating that controlling mixed children often display characteristics of both punitive and caregiving subtypes.

Pair-wise comparisons also demonstrated that caregiving children and their mothers exhibited higher levels of function than punitive children and their mothers, replicating previous research by Teti (1999). While punitive and behaviorally disorganized children are frustrated, hostile or disoriented in their interactions with caregivers, caregiving children and, to some extent, mixed children are excessively helpful and emotionally positive in exchanges with their caregivers at reunion, often with forced, over-bright affect. However, these caregiving behaviors by the child may foster smooth interactions with the parent due to the *child's initiatives* rather than the parent's, creating some risk that parental behavior in these subtypes is rated more positively than warranted.

Notably, we did not find *subtype* differences in maternal or teacher reports of internalizing and externalizing behavior. Instead, the primary finding was that the

disorganized/controlling group as a whole differed from the secure group on all six of the mother and teacher-reported behavior problem scores. At 36 months, this difference was primarily a function of higher scores for the punitive and behaviorally disorganized subtypes; however, by 54 months, on both mother and teacher ratings of externalizing behavior, the means for *all* the subtypes were higher than the means for the secure group, so all subtypes contributed to the elevated score of the disorganized/controlling group. This developmental trend towards increasing differences in behavior problems among the primary attachment groups with age reinforces the importance of following the development of disorganized/controlling attachment behaviors beyond age three.

The more positive behavior scores of both controlling-caregiving and controlling-mixed children up to 4 ½ years of age may indicate more functional adaptations for these subtypes. However, given prior research, we urge caution about extending this conclusion to older ages. Current data suggest that behavior problems are becoming increasingly evident across subtypes by 54 months of age. In addition, previous studies of older children have found more inhibited play among caregiving six-year-olds (Solomon et al., 1995), as well as links between controlling-caregiving behavior and internalizing and externalizing problems by age six (Moss et al., 2004b; Solomon et al., 1995). Notably, at age six, Moss, et al., (2004b) found that controlling-caregiving children were more internalizing than secure children, and their mothers had experienced more loss. Bureau, Easterbrooks, and Lyons-Ruth (2009) found that child controlling-caregiving behavior at age eight was predicted by maternal withdrawal in infancy. They speculated that the mother's withdrawal acted to draw the child into excessively bright and affectionate behavior as a way to maintain the mother's involvement. Finally, at age 20, Lyons-Ruth, Bureau, Hennighausen, Easterbrooks, & Holmes (2009) found that controlling-caregiving young adults

have more suicidal ideation and impulsive, self-damaging behavior than those with organized attachment strategies. Therefore, these signs of more positive functioning associated with controlling-caregiving behavior at 36 months need to be further evaluated over time to better assess the costs and benefits of a controlling-caregiving adaptation later in development.

### *Limitations and future directions*

Several factors may limit the value of the NICHD SECCYD in evaluating pathways associated with disorganization. First, the current cohort was assessed for attachment only until age three, which is an early point in the development of controlling strategies. Second, coding systems for the maternal behaviors that have been validated as predictors of infant disorganization (i.e. frightened, frightening, or atypical behavior, Madigan et al., 2006) were unavailable for use when the NICHD SECCYD study was designed. Omission of these maternal behaviors may weaken findings based on the NICHD SECCYD data.

Third, the current sample is a product of the recruitment and enrollment methods of the NICHD SECCYD, which excluded children with disabilities, those who lived in dangerous areas, and those whose mothers did not speak English. There was also differential attrition in infancy related to low-income and minority status (NICHD ECCRN, 2001) that likely left the sample with relatively few very high-risk children, possibly reducing the magnitude of associations between disorganized/controlling attachment patterns and child and maternal characteristics. Further studies among high-risk and clinical samples are needed.

Finally, work using continuous measures of security and disorganization are needed. The Cassidy-Marvin coding system includes only categorical classifications and sub-classifications. Such categorization limits the power of even very large studies to examine subtype differences, and forces the notion that children fall into fairly discrete and relatively “pure” subtypes.

Controlling children may also display concomitant indicators of disorganized behavior but current methods prevent assessment of the extent to which this overlap occurs. Continuous scales would allow greater precision in specifying the *extent* of disorganized, caregiving, or punitive behavior and would allow one to capture the degree to which these different components of maladaptive behavior are or are not commingled. For example, using continuous scales for caregiving, punitive, and disorganized behavior, Bureau et al. (2009) found that by age eight disorganized behavior rarely appeared alone, but instead occurred in the context of substantial levels of controlling behavior.

### *Clinical Implications*

The early preschool years appear to be an important point for assessing disorganized/controlling attachment behaviors. By intervening with children and families at this time of transition it may be possible to support children's development of more adaptive attachment behaviors. Special attention might focus on improving the quality of mother-child interactions among punitive and behaviorally disorganized dyads during this period, given the significantly lower quality of mother-child interactions among these subtypes.

Findings also point to the importance of working with parents to support maternal psychosocial well-being and positive romantic relationships, not only for the benefit of the mothers but also to support children's development of healthy attachments. In addition, findings indicate that children with disorganized/controlling attachments by age three would benefit from early behavioral supports to prevent behavior problems by 54 months that could contribute to maladjustment in later childhood and into adulthood.



## References

- Abidin, R.R. (1983). *Parenting stress index*.-manual. Charlottesville: Pediatric Psychology Press.
- Achenbach, T.M. (1991a). *Manual for the Child Behavior Checklist*. Burlington, VT: University of Vermont Department of Psychiatry.
- Achenbach, T.M. (1991b). Manual of the Teacher's Report Form and 1991 profile. Burlington, VT: University of Vermont, Department of Psychiatry.
- Achenbach, T.M., Edelbrock, C., & Howell, C.T. (1987). Empirically based assessment of the behavioral/emotional problems of 2- and 3-year-old children. *Journal of Abnormal Psychology, 15*, 629-650.
- Achenbach, T.M., & Rescorla, L.A. (2001). Manual for the ESEBA School-Age Forms and Profiles. Burlington, VT: University of Vermont, Research Center for Children, Youth and Families.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Belsky, J., & Fearon, R.M.P. (2002). Early maternal attachment security, subsequent maternal sensitivity, and later child development: Does continuity in development depend upon continuity of caregiving? *Attachment and Human Development, 4* (3), 361-387.
- Belsky, J., Youngblade, L., & Rovine, M. (1991). Patterns of marital change and parent-child attachment. *Journal of Marriage & the Family, 53*, 487-498.
- Bureau, J.-F., Easterbrooks, A., & Lyons-Ruth, K. (2009). Attachment disorganization and role-reversal in middle childhood: Maternal and child precursors and correlates. *Attachment and Human Development, 11* (3), 1-20.
- Cassidy, J. & Marvin, R. S., with the McArthur Working Group on Attachment. (1992).

*Attachment organization in 2½ to 4½ year olds. Coding manual.* Unpublished coding manual, University of Virginia, Charlottesville.

Cicchetti, D., & Barnett, D. (1991). Attachment organization in maltreated preschoolers.

*Development and Psychopathology, 3*, 397–411.

Greenberg, M. A., Speltz, M. L., DeKlyen, M., & Endriga, M. C. (1991). Attachment security in preschoolers with and without externalizing problems: A replication. *Development and Psychopathology, 3*, 413-430.

Hogan, A.E, Scott, K.G., & Bauer, C.R. (1992). The Adaptive Social Behavior Inventory (ASBI): A new assessment of social competence in high-risk three-year-olds. *Journal of Psychoeducational Assessment, 10*, 230-239.

Lyons-Ruth, K., Bureau, J.-F., Hennighausen, K., Easterbrooks, M. A., & Holmes, B. (March, 2009) Parental helplessness and adolescent role-reversal as correlates of borderline features and self-injury. In J-F. Bureau & K. Lyons-Ruth (Chairs). *Relational predictors of self-damaging behavior in adolescence: Multiwave longitudinal analyses. Symposium to be conducted at the biennial meeting of the Society for Research in Child Development, Denver, CO.*

Lyons-Ruth, K. & Jacobvitz, D. (2008) Disorganized attachment: Genetic factors, parenting contexts, and developmental transformation from infancy to adulthood. In J. Cassidy & P. Shaver (Eds.) *Handbook of attachment: Theory, research, and clinical applications*. 2<sup>nd</sup> edition (p. 666-697). New York: Guilford.

Lyons-Ruth, K., Lyubchik, A., Wolfe, R., & Bronfman, E. (2002). Parental depression and child attachment: Hostile and helpless profiles of parent and child behavior among families at risk. In S. Goodman, & I. Gotlib (Eds.). *Children of depressed parents: Alternative*

*pathways to risk for psychopathology* (pp. 89-121). Washington, D. C.: American Psychological Association Press.

Madigan, S., Bakermans-Kranenburg, M.J., van IJzendoorn, M.H., Moran, G., Pedersen, D., & Benoit, D. (2006). Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment and Human Development*, 8, 89-111.

Main, M., & Cassidy, J. (1988). Categories of response to reunion with the parent at age six: Predictable from infant attachment classifications and stable over a 1-month period. *Developmental Psychology*, 24, 415-526.

McCartney, K., Owen, M. T., Booth, C.L., Vandell, D.L., & Clarke-Stewart, K.A. (2004). Testing a maternal attachment model of behavior problems in early childhood. *Journal of Child Psychology & Psychiatry*, 45 (4), 765-778.

McElwain, N., Cox, M., Burchinal, M., & Macfie, J. (2003). Differentiating among insecure mother-infant attachment classifications: A focus on child-friend interaction and exploration during solitary play at 36 months. *Attachment & Human Development*, 5 (2), 136-164.

Mills-Koonce, W. R., Gariepy, J.-L., Sutton, K., & Cox, M. (2008). Changes in maternal sensitivity across the first three years: Are mothers from different attachment dyads differentially influenced by depressive symptomatology? *Attachment & Human Development*, 10 (3), 299-317.

Moss, E., Bureau, J.-F., Cyr, C., Mongeau, C., & St-Laurent, D. (2004a). Correlates of attachment at age 3: Construct validity of the preschool attachment classification system. *Developmental Psychology*, 40, 323-334.

- Moss, E., Bureau, J.-F., St-Laurent, D., & Tarabulsky, G. M. (in press). Understanding disorganized attachment at preschool and school age: Examining divergent pathways of disorganized and controlling children. In J. Solomon & C. George (Eds.), *Attachment disorganization* (2nd Edition). New York: Guilford.
- Moss, E., Cyr, C., & Dubois-Comtois, K. (2004b). Attachment at early school age and developmental risk: Examining family contexts and behavior problems of controlling-caregiving, controlling-punitive, and behaviorally disorganized children. *Developmental Psychology*, 40, 519-532.
- Moss, E., Cyr, C., Bureau, J.-F., Tarabulsky, G., & Dubois-Comtois, K. (2005). Stability of attachment between preschool and early school-age and factors contributing to continuity/discontinuity. *Developmental Psychology*, 41, 773-783.
- Munson, J. A., McMahon, R. J., & Spieker, S. J. (2001). Structure and variability in the developmental trajectory of children's externalizing problems: Impact of infant attachment, maternal depressive symptomatology, and child sex. *Development & Psychopathology*, 13, 277-296.
- NICHD Early Child Care Research Network. (1997). The effects of infant child care on infant-mother attachment security: Results of the NICHD study of early child care. *Child Development*, 68(5), 860-879.
- NICHD Early Child Care Research Network. (1999). Chronicity of maternal depressive symptoms, maternal sensitivity, and child functioning at 36 months. *Developmental Psychology*, 35, 1297-1310.
- NICHD Early Child Care Research Network. (2001). Child-care and family predictors of preschool attachment and stability from infancy. *Developmental Psychology*, 37, 847-862.

- NICHD Early Child Care Research Network. (2006). Infant-mother attachment classification: Risk and protection in relation to changing maternal caregiving quality. *Developmental Psychology*, 42(1), 38-58.
- O'Connor, T. G., Marvin, R. S., Rutter, M., Olrick, J. T., Britner, P. A., & The English and Romanian Adoptees Study Team. (2003). Child-parent attachment following early institutional deprivation. *Development and Psychopathology*, 15, 19-38.
- O'Connor, E., & McCartney, K. (2006). Testing associations between mother-child and teacher-child relationships. *Journal of Educational Psychology*, 26 (5), 301-326.
- Pianta, R. C. (1992). The Student Teacher Relationship Scale. *University of Virginia, Charlottesville*.
- Radloff, L.S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.
- Rubin, D.B. (1978). *Multiple imputation in sample surveys: A phenomenological Bayesian approach to nonresponse (with discussion)*. Proceedings of the American Statistical Association. Survey Research Methods Section 20-34.
- Schafer, J.L. (1997). *Analysis of incomplete multivariate data*. London: Chapman & Hall.
- Solomon, J., George, C., & De Jong, A. (1995). Children classified as controlling at age six: Evidence of disorganized representational strategies and aggression at home and at school. *Development and Psychopathology*, 7, 447-464.
- Stevenson-Hinde, J., & Shouldice, A. (1995). Maternal interactions and self-reports related to attachment classifications at 4. 5 years. *Child Development*, 66, 583-596.
- Teti, D. M. (1999). Conceptualizations of disorganization in the preschool years. In J. Solomon & C. George (Eds.), *Attachment disorganization* (pp. 213-242). New York: Guilford Press.

U.S Bureau of the Census. (1999). *Statistical abstract of the United States: 1999*.

Washington, DC: U.S. Government Printing Office.

van IJzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, *11*, 225–250.

Wartner, U. G., Grossman, K., Fremmer-Bombik, E., & Suess, G. (1994). Attachment patterns at age six in South Germany: Predictability from infancy and implications for preschool behavior. *Child Development*, *65*, 1014–1027.

Table 1. Descriptive Statistics

	Minimum	Maximum	Mean (SD)	%
Male				48.30
Average income	.28	22.47	3.64 (2.60)	
Secure				61.40
Ambivalent				17.30
Avoidant				4.80
Controlling-caregiving				3.80
Controlling-punitive				2.30
Controlling-mixed				2.90
Behaviorally disorganized				7.50
Romantic relationship quality	1	6.00	3.70 (.91)	
Maternal depression	0	57	9.22 (8.31)	
Maternal parenting stress	20	63	34.27 (6.45)	
Maternal hostility	1	7	1.39 (.82)	
Maternal respect for autonomy	1	7	5.28 (1.12)	
Maternal support	1	7	5.28 (1.33)	
Mother-child cooperation	1	5	3.85 (1.12)	
Child affection	1	7	4.80 (1.26)	
Child compliance	12	31	23.08 (3.39)	
Child disruptive behavior	7	18	10.58 (7.14)	
Child internalizing behavior (mother report-36 mos.)	30	91	51.20 (9.52)	
Child externalizing behavior	30	80	51.12 (8.51)	

(mother report – 36 mos.)

Child internalizing behavior	33	74	47.35 (8.04)
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(mother report - 54 mos.)

Child externalizing behavior	30	82	51.69 (8.54)
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(mother report-54 mos.)

Child internalizing behavior	34	92	50.94 (7.53)
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(teacher report - 54 mos.)

Child externalizing behavior	35	88	50.49 (7.53)
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(teacher report- 54 mos.)

Peer positive interactions	-2.48	9.47	-.03 (1.60)
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(54 mos.)

Quality of teacher-child relationship	66	134.00	115.11 (8.63)
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(54 mos.)



Table 2. Multiple ANCOVA Comparisons of Secure, Insecure-Organized and Disorganized/Controlling Groups

	Secure ( <i>n</i> = 701)	Insecure- Organized ( <i>n</i> = 252)	Disorganized/ Controlling ( <i>n</i> = 187)	Overall F-test (2, 1138)	$\eta$	Linear trend sig.	Significant paired comparisons
<b>Maternal well-being</b>	<b>M (sd)</b>	<b>M (sd)</b>	<b>M (sd)</b>				
Romantic rel. qual.	3.74 (.90)	3.75 (.88)	3.60 (.95)	2.12	.06		
Depression	8.58 (7.91)	9.24 (8.93)	10.42 (8.60)	3.75**	.10	**	S<D
Parenting stress	33.97 (6.32)	34.83 (6.65)	34.55 (6.32)	1.90	.05		
<b>Mother-child interactions</b>							
Maternal hostility	1.30 (.70)	1.30 (.74)	1.67 (1.19)	15.84***	.17	***	S<D, I<D <sup>a</sup>
Mat. resp. auton.	5.42 (1.01)	5.20 (1.14)	4.90 (1.30)	17.59***	.17	***	S>I, S>D, I>D
Maternal support	5.45 (1.21)	5.09 (1.44)	4.86 (1.48)	18.21***	.17	***	S>I, S>D, I>D
Mo.-child coop.	4.05 (1.03)	3.66 (1.18)	3.45 (1.20)	27.63***	.22	***	S>I, S>D, I>D,
Child affection	4.94 (1.22)	4.58 (1.32)	4.53 (1.31)	12.90***	.14	***	S>I, S>D
<b>Child Social Adaptation</b>							
Compliance	23.43 (3.32)	22.62 (3.33)	22.55 (3.56)	8.64***	.14	***	S>I, S>D
Disruptive	10.54 (1.98)	10.56 (2.15)	10.76 (1.93)	.85	.03		
Internalizing (Mo.-36)	50.20 (9.01)	52.61 (9.86)	52.67(10.13)	9.02***	.14	***	S<I, S<D

Disorganized attachment at age three<sup>41</sup>

Externalizing (Mo.-36)	50.46 (8.28)	52.20 (9.06)	52.57 (8.51)	6.81***	.10	***	S<I, S<D
Internalizing (Mo.-54)	46.58 (8.45)	48.17 (8.32)	48.62 (8.98)	11.35**	.10	**	S<I, S<D
Externalizing (Mo.-54)	51.29 (9.19)	51.94 (9.16)	53.01 (8.68)	5.39*	.07	*	S<D
Internalizing (T. -54)	50.05 (7.76)	52.27 (7.90)	52.53 (8.53)	11.74***	.10	**	S<I, S<D
Externalizing (T. -54)	49.69 (7.95)	51.48 (7.41)	52.56 (8.78)	11.73***	.07	***	S<I, S<D
Peer interaction (54)	.06 (1.73)	-.16 (1.66)	-.12 (1.65)	2.92*	.24	*	S>I, S>D
Teach.-child rel. (54)	115.85 (9.28)	114.08 (8.71)	113.39 (9.30)	7.12**	.33	***	S>I, S>D

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Note: Gender and family income are controlled in all analyses. <sup>a</sup> S = Secure, I = Insecure, D = Disorganized/Controlling. \*  $p < .05$ , \*\*  $p$

$< .01$ , \*\*\*  $p < 0.001$

Table 3. Multiple ANCOVA Comparisons Among Disorganized/Controlling Subtypes and Between Disorganized/Controlling Subtypes and Secure and Insecure-Organized Groups

	Controlling- Caregiving (CG, <i>n</i> = 43)	Controlling- Punitive (Pn, <i>n</i> = 26)	Controlling- Mixed (Mx, <i>n</i> = 33)	Behaviorally Disorganized (BD, <i>n</i> = 85)	Overall F-test <sup>b</sup>	Significant paired comparisons	$\eta^c$
<b>Maternal well-being</b>	M (sd)	M (sd)	M (sd)	M (sd)			
Romantic	3.79 <sup>a</sup>	3.86	3.70	3.37	2.99*	CG>BD,	.22
rel. quality	(.77)	(.90)	(.92)	(1.02)	[3.08] **	Pn>BD, [S>BD, I>BD]	[.10]
Depression	8.40	9.73	9.24	12.05	2.12	[S<BD, I<BD]	.17
	(6.89)	(6.29)	(8.95)	(9.53)	[2.89]*		[.10]
Parenting stress	34.11	35.13	33.36	35.07	.72		.10
	(5.75)	(7.28)	(7.28)	(5.89)	[1.21]		[.10]
<b>Mother-child interactions</b>							
Maternal hostility	1.64 <sup>a</sup>	1.73	1.40	1.78	.90	[S<CG, S<Pn,	.10
	(1.30)	(.15)	(.69)	(1.34)	[7.04]***	S<BD, I<Pn, I<BD]	[.17]

Disorganized attachment at age three<sup>43</sup>

Maternal respect	5.24	4.54	5.07	4.77	2.32	[S>Pn, S>BD,	.20
for autonomy	(1.41)	(1.30)	(1.18)	(1.27)	[8.66]***	I>Pn, I>BD]	[.20]
Maternal support	5.09	4.64	5.42	4.59	3.22*	Mx>Pn,	.22
	(1.70)	(1.38)	(1.04)	(1.45)	[9.36]***	Mx>BD, [S>Pn	[.20]
						S>BD, I>BD]	
Mother-child	3.60	3.44	3.48	3.38	.38	[S>CG, S>Pn,	.10
cooperation	(1.19)	(1.23)	(1.20)	(1.17)	[11.17]***	S>Mx, S>BD,	[.22]
						I>BD]	
Child affection	4.94	4.27	5.15	4.17	6.98**	CG>Pn,	.22
	(1.39)	(1.00)	(1.01)	(1.31)	[9.07]***	CG>BD,	[.20]
						Mx>Pn,	
						Mx>BD,	
						[S>Pn, S>BD,	
						Mx>I, I>BD]	
<hr/>							
<b>Child social adaptation</b>							
Compliance	23.07 <sup>a</sup>	21.19	22.64	22.67	1.63	[S>Pn, S>BD,	.17
	(3.55)	(2.84)	(4.22)	(3.43)	[4.46]***	I>Pn]	[.14]

Disorganized attachment at age three<sup>44</sup>

Disruptive	10.19	11.46	11.33	10.60	3.72*	Pn>CG,	.24
behavior	(1.76)	(1.75)	(1.96)	(1.95)	[2.30]*	Mx>CG,	[.10]
						Pn>BD,	
						[S<Pn, S<Mx,	
						I<Pn, I<Mx]	
Internalizing	51.28	54.50	52.65	53.20	1.20	[S<Pn, S<BD]	.14
(mother 36)	(10.27)	(7.67)	(7.38)	(8.65)	[4.93]***		[.14]
Externalizing	51.17	54.15	51.76	53.06	.89	[S<Pn, S<BD]	.10
(mother 36)	(11.28)	(9.21)	(9.63)	(8.41)	[3.17]**		[.10]
Internalizing	47.94	48.54	47.17	49.55	.57	[S<BD]	.10
(mother 54)	(8.49)	(10.23)	(9.18)	(8.79)	[2.88]**		[.10]
Externalizing	52.72	52.23	53.69	53.14	.93		.10
(mother 54)	(8.15)	(7.69)	(9.10)	(9.18)	[1.18]		[.10]
Internalizing	51.60	52.54	53.09	53.19	1.21	[S<BD]	.13
(teacher 54)	(9.44)	(8.83)	(8.88)	(6.72)	[5.48]***		[.14]

Disorganized attachment at age three<sup>45</sup>

Externalizing	51.16	52.16	53.09	53.19	.57	[S<Pn, S<BD,	.10
(teacher 54)	(9.85)	(8.54)	(8.58)	(9.66)	[5.10]***	I<BD]	[.14]
Peer intact.	-.09	-.24	.78	-.45	4.70*	Mx>CG,	.26
(54 mos)	(1.69)	(1.75)	(2.04)	(1.29)	[3.33]***	Mx>Pn,	[.10]
						Mx>BD, [S<Mx,	
						S>BD, I<Mx]	
Teacher-child	116.03	116.51	112.19	111.08	2.59*	CG>BD, [S>Mx,	.20
relat. (54 mos.)	(7.14)	(8.43)	(8.13)	(10.57)	[4.43]***	S>BD, I>BD]	[.14]

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<sup>a</sup> Cell means and (standard deviations) are presented. <sup>b</sup> F-tests for comparisons among the four disorganized/controlling subtypes presented first; F-tests for all six comparisons, including secure and insecure-organized groups, in brackets. <sup>c</sup> Effect size estimates for the four subtype comparisons presented first; effect size estimates for the six-group comparisons in brackets.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < 0.001$